METHOD AND APPARATUS FOR OPTIMIZATION DURING CAMERA FLASH PULSES

TECHNICAL FIELD

[0001]   The invention relates to an electronic device and, more particularly, to peak current optimization during camera flash pulses.

BACKGROUND

[0002]   As electronic devices continue to become more sophisticated, these devices provide an increasing amount of functionality and features. Many electronic devices continue to have more and more powerful camera flash modules that cause significant current spikes when taking pictures. As consumers demand increased functionality from electronic devices, there is a need to provide improved devices having increased capabilities while maintaining robust and reliable product configurations.

SUMMARY

[0003]   Various aspects of examples of the invention are set out in the claims.

[0004]   In accordance with one aspect of the invention, an apparatus is disclosed. The apparatus includes a camera, a camera flash, and a current optimization system. The current optimization system is connected to the camera and the camera flash. The current optimization system is configured to calculate a shutdown period based on a flash mode of the camera.

[0005]   In accordance with another aspect of the invention, a method is disclosed.

[0006]   A command is received from a camera of a device. Predefined peripherals/functionalities of the device are attenuated. An amount of time the predefined peripherals/functionalities are attenuated is calculated based on a flash mode of the camera.

[0007]   In accordance with another aspect of the invention, a computer program product is disclosed. The computer program product includes a computer-readable medium bearing computer program code embodied therein for use with a computer. The computer program code includes code for receiving a command from a camera of a device. Code for attenuating predefined peripherals/functionalities of the device. Code for calculating an amount of time the predefined peripherals/functionalities are attenuated based on a flash mode of the camera.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]   For a more complete understanding of example embodiments of the present invention, reference is now made to the following descriptions taken in connection with the accompanying drawings in which:

[0009]   FIG. 1 is a front view of an electronic device incorporating features of the invention;

[0010]   FIG. 2 is a rear view of the electronic device shown in FIG. 1;

[0011]   FIG. 3 is a representation illustrating flash timing schemes of the electronic device shown in FIG. 1;

[0012]   FIG. 4 is a representation illustrating a performance mode flash timing scheme of the electronic device shown in FIG. 1;

[0013]   FIG. 5 is a representation illustrating a normal mode flash timing scheme of the electronic device shown in FIG. 1;

[0014]   FIG. 6 is an exemplary method of the device shown in FIG. 1;

[0015]   FIG. 7 is another exemplary method of the device shown in FIG. 1; and

[0016]   FIG. 8 is a schematic drawing illustrating components of the electronic device shown in FIG. 1.

DETAILED DESCRIPTION OF THE DRAWINGS

[0017]   An example embodiment of the present invention and its potential advantages are understood by referring to FIGS. 1 through 8 of the drawings.

[0018]   Referring to FIG. 1, there is shown a front view of an electronic device 10 incorporating features of the invention. Although the invention will be described with reference to the exemplary embodiments shown in the drawings, it should be understood that the invention can be embodied in many alternate forms of embodiments. In addition, any suitable size, shape or type of elements or materials could be used.

[0019]   According to one example of the invention, the device 10 is a multi-function portable electronic device. However, in alternate embodiments, features of the various embodiments of the invention could be used in any suitable type of portable electronic device such as a mobile phone, a gaming device, a music player, a notebook computer, or a personal digital assistant, for example. In addition, as is known in the art, the device 10 can include multiple features or applications such as a camera, a music player, a game player, or an Internet browser, for example. The device 10 generally comprises a housing 12, a transmitter 14, a receiver 16, an antenna 18 (connected to the transmitter 14 and the receiver 16), electronic circuitry 20, such as a controller (which could include a processor [or central processing unit (CPU)], for example) 21 and a memory 23 for example, within the housing 12, a user input region 22 and a display 24 (which could include a graphics processing unit [GPU] 25, for example). It should be understood that although the user input region 22 is illustrated as a keypad, various exemplary embodiments of the invention may include touch-screen technology at the user input region 22. The display 24 could also form a user input section, such as a touch screen. It should be noted that in alternate embodiments, the device 10 can have any suitable type of features as known in the art. Additionally, all of these components within the device 10 are normally powered by a portable power supply such as a battery 27.

[0020]   Referring now also to FIG. 2, the electronic device 10 further comprises a camera 26 which is shown as being rearward facing (for example for capturing images and/or video for local storage) but may alternatively or additionally be forward facing (for example for video calls). The camera 26 may be controlled by a shutter actuator 28 and optionally by a zoom actuator 30. However, any suitable camera control functions and/or camera user inputs may be provided.

[0021]   The electronic device 10 further comprises a camera flash 32 and a current optimization system 34. The camera flash generally provides one flash sequence (single photo capture) which may include one or two pre-flash pulses and one main-flash pulse. According to some embodiments of the invention, if the first pre-flash pulse is satisfactory, then no second pre-flash pulse is generally provided. Additionally, in some embodiments of the invention, a flash driver 36 includes safety features that allow up to six consecutive photos to be taken (six flash sequences in a row) and forces 3-4 s delay